

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 20, 2008 has been entered.
2. In the remarks filed on June 20, 2008, Applicant submitted arguments for allowability of pending claims 49, 50, 52-63, 65-67, and 86.

Response to Arguments

3. Applicant's arguments with respect to claims 49, 50, 52-63, 65-67, and 86 have been considered but are moot in view of the new grounds of rejection.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 49, 50, 56, 63, 65-67, and 86 are rejected under 35 U.S.C. 102(e) as being anticipated by King et al. (US Patent Number 6,700,686 B2).

Regarding claim 49, King discloses an apparatus for recording holographically stored information comprising: at least one portion of an aspherical reflecting surface having two focal points (Figure 3 element 135); at least one additional reflecting surface (Figure 3 element 130); a motive device for rotating at least one of either at least one portion of the aspherical reflecting surface or the at least one additional reflecting surface about a first axis and, independently, a second axis, perpendicular to the first axis (see the discussion regarding the positioner and associated electronics in column 7 lines 19-37, and column 8 lines 12-19); and means for directing an object beam and a reference beam that are mutually coherent along their respective optical paths (Figures 1 and 3 and the discussion in column 4 lines 53-67 and column 5 lines 1-16), wherein either the object beam or the reference beam is reflected from at least one portion of the aspherical reflecting surface to intersect and form an interference pattern with the reference beam or the object beam at a storage location in a recording media at or near one of the two focal points (Figure 3 and the discussion in column 4 lines 61-63, column 5 lines 1-16).

Regarding claim 50. King further discloses wherein at least one portion of the aspherical reflecting surface is a portion of an ellipsoidal reflecting surface (Figure 3 element 135 and the discussion in column 5 lines 7-9).

Regarding claim 56, King further discloses wherein a first focus of the ellipsoidal reflecting surface is located on at least one additional reflecting surface; and a second

focus of the ellipsoidal reflecting surface is located at or near a surface of or within the recording media (column 7 lines 13-16).

Regarding claim 63, King further discloses wherein the additional reflecting surface is a planar mirror (see Figure 3 element 130).

Regarding claim 65, King further discloses wherein the additional reflecting surface is an aspherical surface (Figure 3 element 130).

Regarding claim 66, King further discloses wherein said additional reflecting surface and the recording media are disposed on the same side of any plane that is (a) parallel to a surface of the recording media and (b) intersects the ellipsoidal reflecting surface (Figures 1 and 3).

Regarding claim 67, King further discloses wherein a portion of the reference beam impinging on the additional reflecting surface is coaxial with an axis formed by two foci of the ellipsoidal reflecting surface (Figures 1 and 3).

Regarding claim 86, King further discloses wherein either the object beam or the reference beam is directed to the ellipsoidal reflecting surface by reflecting either the object beam or the reference beam from the additional reflecting surface (Figure 3 and the discussion in column 5 lines 1-16), and wherein said additional reflecting surface can be rotated about at least one axis to effect redirection of one of said object or reference beams through an azimuthal arc on said ellipsoidal reflecting surface (column 5 lines 1-16, column 7 lines 19-37, column 8 lines 12-19).

6. Claims 52-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over King et al. (US Patent Number 6,700,686 B2) in view of Dalziel (US PGPub Number 2003/0053232 A1).

Regarding claim 52, King discloses the apparatus of claim 49 as noted in the 35 U.S.C. 102(e) rejection above but fails to specifically disclose that the motive device for rotating the additional reflecting surface is a two-dimensional galvanometer. Dalziel, however, discloses an actuator-controlled mirror wherein the motive device for rotating the additional reflecting surface is a two-dimensional galvanometer (see Dalziel paragraphs [0018] and [0019]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the two-dimensional galvanometer device taught by Dalziel into the holographic storage apparatus of King. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to produce an apparatus that changes the reflected direction of a beam in a controlled and accurate manner (Dalziel paragraphs [0018] and [0019]).

Regarding claim 53, King discloses the apparatus of claim 49 as noted in the 35 U.S.C. 102(e) rejection above but fails to specifically disclose that the motive device for rotating the additional reflecting surface is a MEMS device. Dalziel, however, discloses an actuator-controlled mirror wherein the motive device for rotating the additional reflecting surface is a MEMS device (see Dalziel paragraph [0016]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the MEMS device taught by Dalziel into the

holographic storage apparatus of King. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to produce an apparatus that changes the reflected direction of a beam in a controlled and accurate manner (Dalziel paragraphs [0018] and [0019]).

Regarding claim 54, King discloses the apparatus of claim 49 as noted in the 35 U.S.C. 102(e) rejection above but fails to specifically disclose that the motive device for rotating the additional reflecting surface includes two independently controlled one-dimensional galvanometers. Dalziel, however, discloses an actuator controlled mirror wherein the motive device for rotating the additional reflecting surface includes two independently controlled one-dimensional galvanometers (see Dalziel paragraph [0018] and the discussion of the one axis galvanometer mirror).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the two independently controlled one-dimensional galvanometers taught by Dalziel into the holographic storage apparatus of King. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to produce an apparatus that changes the reflected direction of a beam in a controlled and accurate manner (Dalziel paragraphs [0018] and [0019]).

Regarding claim 55, King discloses the apparatus of claim 49 as noted in the 35 U.S.C. 102(e) rejection above but fails to specifically disclose that the motive device for rotating the additional reflecting surface is a one-dimensional galvanometer mounted on a rotary motive device. Dalziel, however discloses an actuator controlled mirror wherein

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the motive device for rotating the additional reflecting surface is a one-dimensional galvanometer mounted on a rotary motive device (see Dalziel paragraph [0015] and paragraph [0018] where Dalziel discusses a one axis galvanometer mirror).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the one-dimensional galvanometer taught by Dalziel into the holographic storage apparatus of King. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to produce an apparatus that changes the reflected direction of a beam in a controlled and accurate manner (Dalziel paragraphs [0018] and [0019]).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 57-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over King et al. (US Patent Number 6,700,686 B2) in view of over Dewald (US Patent Number 5,566,387).**

Regarding claim 57, King discloses the apparatus of claim 56 and noted in the 35 U.S.C. 102(e) rejection above.

King further discloses either the object beam or the reference beam is directed to the ellipsoidal reflecting surface by reflecting either the object beam or the reference

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beam from the additional reflecting surface (Figure 3 and column 5 lines 7-9). While King also discloses wherein said additional reflecting surface can be rotated about at least one axis to effect redirection of one of said object or reference beams through an azimuthal arc (column 7 lines 19-37, and column 8 lines 12-19) King fails to specifically disclose an azimuthal arc of any angle between 0° and 45° on said ellipsoidal reflecting surface.

Dewald, however, discloses an apparatus for recording holographically stored information utilizing angle multiplexing. Although Dewald does not explicitly recite an azimuthal arc of any angle between 0° and 45° , Dewald discusses reflection at *a plurality of angles* and the reference beam for *all angles* of reflection, which clearly suggests to one of ordinary skill in the art that the azimuthal arc includes any angle between 0° and 45° . Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Dewald into that of King and include an azimuthal arch of any angle between 0° and 45° in order to accurately redirect the reference beam toward the storage location.

Regarding claim 58, King discloses the apparatus of claim 56 and noted in the 35 U.S.C. 102(e) rejection above.

King further discloses either the object beam or the reference beam is directed to the ellipsoidal reflecting surface by reflecting either the object beam or the reference beam from the additional reflecting surface (Figure 3 and column 5 lines 7-9). While King also discloses wherein said additional reflecting surface can be rotated about at least one axis to effect redirection of one of said object or reference beams through an

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azimuthal arc (column 7 lines 19-37, and column 8 lines 12-19) King fails to specifically disclose an azimuthal arc of any angle between 0° and 90° on said ellipsoidal reflecting surface.

Dewald, however, discloses an apparatus for recording holographically stored information utilizing angle multiplexing. Although Dewald does not explicitly recite an azimuthal arc of any angle between 0° and 90° , Dewald discusses reflection at *a plurality of angles* and the reference beam for *all angles* of reflection, which clearly suggests to one of ordinary skill in the art that the azimuthal arc includes any angle between 0° and 90° . Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Dewald into that of King and include an azimuthal arch of any angle between 0° and 90° in order to accurately redirect the reference beam toward the storage location.

Regarding claim 59, King discloses the apparatus of claim 56 and noted in the 35 U.S.C. 102(e) rejection above.

King further discloses either the object beam or the reference beam is directed to the ellipsoidal reflecting surface by reflecting either the object beam or the reference beam from the additional reflecting surface (Figure 3 and column 5 lines 7-9). While King also discloses wherein said additional reflecting surface can be rotated about at least one axis to effect redirection of one of said object or reference beams through an azimuthal arc (column 7 lines 19-37, and column 8 lines 12-19) King fails to specifically disclose an azimuthal arc of at least 90° and less than or equal to 180° on said ellipsoidal reflecting surface.

Dewald, however, discloses an apparatus for recording holographically stored information utilizing angle multiplexing. Although Dewald does not explicitly recite an azimuthal arc of at least 90° and less than or equal to 180° , Dewald discusses reflection at *a plurality of angles* and the reference beam for *all angles* of reflection, which clearly suggests to one of ordinary skill in the art that the azimuthal arc includes at least 90° and less than or equal to 180° . Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Dewald into that of King and include an azimuthal arc of at least 90° and less than or equal to 180° in order to accurately redirect the reference beam toward the storage location.

Regarding claim 60, King discloses the apparatus of claim 56 and noted in the 35 U.S.C. 102(e) rejection above.

King further discloses either the object beam or the reference beam is directed to the ellipsoidal reflecting surface by reflecting either the object beam or the reference beam from the additional reflecting surface (Figure 3 and column 5 lines 7-9). While King also discloses wherein said additional reflecting surface can be rotated about at least one axis to effect redirection of one of said object or reference beams through an azimuthal arc (column 7 lines 19-37, and column 8 lines 12-19) King fails to specifically disclose an azimuthal arc of at least 90° and less than or equal to 270° on said ellipsoidal reflecting surface.

Dewald, however, discloses an apparatus for recording holographically stored information utilizing angle multiplexing. Although Dewald does not explicitly recite an azimuthal arc of at least 90° and less than or equal to 270° , Dewald discusses reflection at

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a plurality of angles and the reference beam for *all angles* of reflection, which clearly suggests to one of ordinary skill in the art that the azimuthal arc includes at least 90° and less than or equal to 270° . Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Dewald into that of King and include an azimuthal arc of at least 90° and less than or equal to 270° in order to accurately redirect the reference beam toward the storage location.

Regarding claim 61, King discloses the apparatus of claim 56 and noted in the 35 U.S.C. 102(e) rejection above.

King further discloses either the object beam or the reference beam is directed to the ellipsoidal reflecting surface by reflecting either the object beam or the reference beam from the additional reflecting surface (Figure 3 and column 5 lines 7-9). While King also discloses said additional reflecting surface can be rotated about at least one axis to effect redirection of one of said object or reference beams through an azimuthal arc (column 7 lines 19-37, and column 8 lines 12-19) King fails to specifically disclose an azimuthal arc of at least 90° and less than or equal to 360° on said ellipsoidal reflecting surface.

Although Dewald does not explicitly recite an azimuthal arc of at least 90° and less than or equal to 360° , Dewald discusses reflection at *a plurality of angles* and the reference beam for *all angles* of reflection, which clearly suggests to one of ordinary skill in the art that the azimuthal arc includes at least 90° and less than or equal to 360° . Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Dewald into that of King and include

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an azimuthal arch of at least 90° and less than or equal to 360° in order to accurately redirect the reference beam toward the storage location.

Regarding claim 62, King discloses the apparatus of claim 56 and noted in the 35 U.S.C. 102(e) rejection above.

King further discloses either the object beam or the reference beam is directed to the ellipsoidal reflecting surface by reflecting either the object beam or the reference beam from the additional reflecting surface (Figure 3 and column 5 lines 7-9). While King also discloses wherein said additional reflecting surface can be rotated about at least one axis to effect redirection of one of said object or reference beams through an azimuthal arc (column 7 lines 19-37, and column 8 lines 12-19) King fails to specifically disclose an azimuthal arc of at least 180° and less than or equal to 360° on said ellipsoidal reflecting surface.

Although Dewald does not explicitly recite an azimuthal arc of at least 180° and less than or equal to 360° , Dewald discusses reflection at *a plurality of angles* and the reference beam for *all angles* of reflection, which clearly suggests to one of ordinary skill in the art that the azimuthal arc includes at least 180° and less than or equal to 360° . Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Dewald into that of King and include an azimuthal arch of at least 180° and less than or equal to 360° in order to accurately redirect the reference beam toward the storage location.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LaTanya Bibbins whose telephone number is (571)270-1125. The examiner can normally be reached on Monday through Friday 7:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner, Art Unit 2627

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